vertical muffle for continuous service, constructed according to the designs of the author, was in use at the PoutilofI works (Petrograd). In the arsenal the daily interruption of the work resulted in the rapid wearing out of the muffle, and after a run of two months it was decided to remove the cast-iron muffle and operate the furnace with a perforated brick hearth through which waste gases could pass off. The furnace was reconstructed in this manner, without a muffle, and upon being placed in operation worked perfectly, heating very uniformly and fulfilling perfectly all the demands for annealing and tempering which were made upon it.

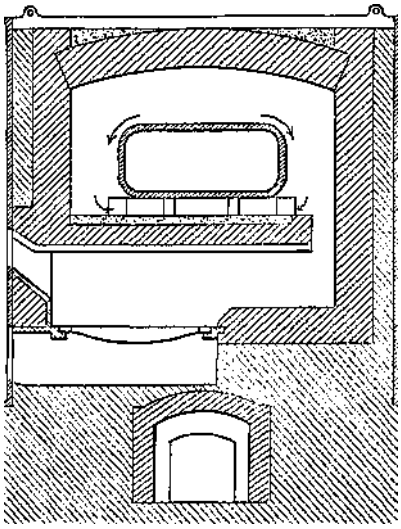

FIG. 135.—Cross-section through Firebox.

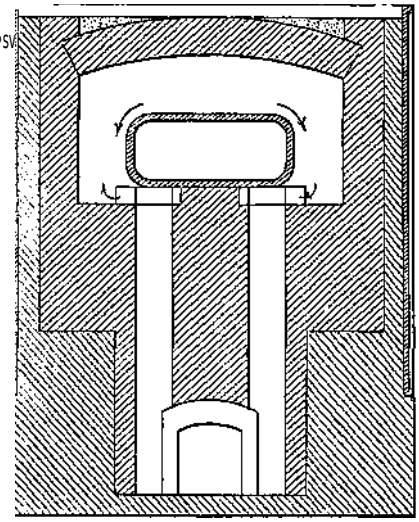

FIG. 136.—Cross-section through Waste Gas Ports.

The following shows the computations which were made:
The volume of the heating chamber, according to the design,
was 3 m^3 30; the temperature of the gas was to be 1000°, the
combustion being neutral, that is to say, without excess air.
The instantaneous calorific intensity was computed as 2000°,
giving a drop in temperature of the gases of 200° per second, the"
time which the gases remain in the

heating chamber being

2000-1000

200 - = 5 seconds.